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ABSTRACT

An overview is presented of the most recent Educational Technology Equipped Classroom (ETEC) developed at the State University of New York at Buffalo. The latest ETEC is the product of an extensive development procedure with input from faculty. The first three classrooms renovated to incorporate educational technology at the university were referred to as Media Equipped Classrooms. Building on the advantages of these, an ETEC was prepared to support the curriculum in the School of Management. Voice and data lines were an integral part of this classroom, but shortcomings in the teaching station became apparent. Planning a second ETEC classroom provided an opportunity to alter the teaching station and to make appropriate improvements where feasible. Faculty input was obtained through questionnaires and meetings. Significant changes were made in the design of the teaching station and in the electronic circuitry and signal processing. Access and security were also improved. The new classroom has been in use one semester and is being favorably received. Recommendations are being developed for additional ETEC software. An appendix contains 15 drawings and exhibits illustrating classroom features. (SLD)

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Title:

Educational Technology Equipped Classrooms: Re-Design Based on Faculty Feedback

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Forward

The purpose of this paper is to give an overview of the most recent Educational Technology Equipped Classroom (ETEC) developed at the State University of New York at Buffalo. Emphasis will be placed on the re-design of the teaching station and how the various media and support technology are incorporated into the custom built podium. The rationale for some of the changes in this latest ETEC classroom, based on assessment of earlier classrooms and input from the faculty, are also discussed.

The authors had the privilege of presenting a paper, **Media Equipped Classrooms: Giving Attention To The Teaching Station**, at the 1992 AECT Conference in Washington, D.C. This current paper is an extension and further refinement of technology in the classroom. The earlier paper dealt with our initial Media Equipped Classrooms and the design of our original ETEC teaching station for the School of Management. Emphasis was placed on the rationale for change, the planning process, orientation of faculty, assessment of the teaching station as well as extensive CAD drawings and cost data. If interested, readers can obtain a copy of this earlier paper through the ERIC Clearinghouse on Information Resources (ED 346 841).

Although the overall responsibility for planning and implementing this project was assigned to the presenters, it could not have been successfully completed without the assistance and expertise of many of the staff in Academic Services and Operational Support Services, two units within Computing and Information Technology. In particular, the presenters wish to acknowledge Dr. Richard Lesniak, Director of Academic Services, Mark Greenfield, Supervisor of Media Equipment Services, William Maiman, Project Engineer, Assistant Engineers Mark White and James Crone, and Student-Assistants Jeffrey Gritsavage (a Civil Engineering student who developed the CAD drawings and a ergonomic analysis of the teaching station) and Aaron Somerstein (a School of Management student who provided general project assistance including configuring the teaching station PS/2 computer hard drive).

Background

State University of New York at Buffalo:

The State University of New York at Buffalo is the most comprehensive unit of the 64 campus SUNY system, enrolling approximately 26,000 undergraduate and graduate students. As one of four university centers, its mandate is to concentrate on upper division and graduate programs and research. It offers 93 undergraduate, 113 master's and 83 doctorate degree programs, as well as four professional degree programs and 14 graduate certificates. Faculties include not only the traditional arts and sciences divisions of Arts and Letters, Natural Sciences and Mathematics, and Social Sciences, but also the Undergraduate College, Millard Fillmore College (Evening Division) and Schools of Architecture, Dental Medicine, Education, Engineering, Health Related Professions, Library Studies, Law, Medicine and Biomedical Sciences, Nursing, Pharmacy and Social Work.

These diverse programs are housed on two separate campuses. The older South Campus in the City of Buffalo has been refurbished into a Health Sciences Center. A large new North Campus was recently completed in the suburb of Amherst, approximately five miles from the Health Sciences campus.

Computing and Information Technology:

During the Summer of 1992, a major organizational change took place in which the former Educational Technology Services, along with several other service units, were more closely integrated into Computing and Information Technology. The reorganization consolidated six separate units into four distinct units in order to take full advantage of the newer technologies; especially, computers, networking, communications technology and microcomputer software. This realignment of staff along functional commonalities should position the organization to provide improved support and development for facilities such as our ETEC classrooms and instructional support labs, in which the convergence of computing and the more traditional educational technologies is increasingly evident. Briefly, these four units are described as follows:

Academic Services, Computing & Information Technology

This unit focuses on instructional and research computing support, art and photographic services, media resources, network user support, information technology centers and UB micro computer sales.

Administrative Computing Services

This unit focuses on computer support for registration, student accounts, financial aid, housing, financial systems, admissions and data administration.

Technical Support Services

This unit focuses on software support of mainframe, UNIX and LAN systems, networking and office systems.

Operational Support Services

This unit focuses on computer, network and telephone operations; equipment repair; telephone services; and, facilities and systems engineering development for Computing and Information Technology.

In the design, development and support of the Educational Technology Equipped Classrooms at the State University of New York at Buffalo, expertise and support is drawn from Academic Services (media resources), Technical Support Services (LAN support) and Operational Support Services (design and installation, equipment repair and maintenance).

Introduction - Educational Technology Equipped Classrooms

Over the last four years, five medium size classrooms have been renovated at the State University of New York at Buffalo for the purpose of incorporating some of the latest presentation technology. The first three classrooms were referred to as Media Equipped Classrooms (MEC). They were not only designed to incorporate both video and computer display, but also reflected changes in the mode in which services were provided. Faculty teaching in a Media Equipped Classroom would have immediate access to a variety of media equipment and support technology without having to reserve the equipment prior to their class session.

The types of equipment placed in these MEC classrooms included an overhead projector, 35mm slide projector(s), 16mm motion picture projector, video tape player (1/2" VHS and/or 3/4" U-Matic), audio cassette tape recorder/player, sound reinforcement, laser pointer, microcomputer, video/data monitor or CRT projector, projection screens and custom designed cabinets to securely store this equipment. A telephone and data lines were also installed in each of these MEC classrooms.

Although well received by the faculty assigned to teach in these Media Equipped Classrooms, these facilities had some inherent problems. Faculty had to open up the storage cabinet (combination lock), remove the equipment, set it up and then at the conclusion of the class session properly secure the equipment in the MEC cabinets. When using a microcomputer, the display monitor and keyboard were pulled out of the cabinet (the CPU unit stayed inside of the cabinet) and placed on a desk. Not only were there a mess of cables to contend with, proper lighting at the teaching station was always a problem because the classroom had to be darkened sufficiently in order to display data through the GE Imager 310 projector mounted on the ceiling. These MEC classrooms, although a vast improvement over the traditional classroom, were not as the staff had hoped for, nor did they incorporate the latest in presentation technology.

The fourth renovated classroom, currently referred to as an Educational Technology Equipped Classroom (ETEC), incorporated some of the latest presentation technology. It was designed to support the curriculum in the School of Management and was ready for the beginning of the 1991 Fall semester.

This ETEC classroom features a custom designed teaching station (modular podium/ attached side cabinet) that houses a variety of electronic presentation systems including an IBM PS/2 microcomputer (model 55 SX which supports 80386 applications), a Wolf Visualizer (a CCD camera platform that converts transparencies, hardcopy and small three-dimensional objects to video), a Navitar VideoMate (converts 35mm slides to video) and a VHS videotape player. These "electronic" images are displayed on a large screen with a G.E. 410 Imager data/video projector mounted on the ceiling. Sound reinforcement (P.A. system) and audio recording are controlled from the teaching station. A laser pointer is also available.

Like the first three MEC classrooms, voice and data lines are an integral part of this Educational Technology Equipped Classroom. An auto/dial telephone is installed in the teaching station that terminates at the Media Equipment Services office. In the event of an equipment failure or an operational problem, the instructor can have immediate contact with a trained media specialist for assistance. In addition, the instructor can place calls to the Computing Center (DCA/Ethernet connections), School of Management Computer Laboratory, Office of Public Safety and the Physical Plant. A data line is also provided which permits the instructor to access an IBM mainframe computer, network servers, or numerous other connections and services provided through our University data networks.

A unique feature of this ETEC classroom is that it is connected to the School of Management's Local Area Network (LAN). When the IBM PS/2 computer is turned on, it automatically boots up into the School of Management's LAN system. The advantage to the instructors teaching in this classroom is that they can incorporate demonstrations using the

LAN's software and data files. Space is limited on the hard drive and there is no need to take valuable class time to load a software program into the hard drive of the IBM computer.

The LAN is wired using a Ethernet topology, the standard chosen by the University for networking computers. The Jacobs 110 ETEC classroom is one of 42 IBM PS/2 workstations connected to the LAN within the School of Management. The network uses an IBM PS/2 Model 70 personal computer as a file server. The file server's 120 MB drive stores the Novell and DOS operating systems as well as all the necessary application software and printing utilities.

At the workstation level (e.g., the Jacobs 110 ETEC classroom), the user ID is the workstation. Each workstation has a PROM chip and an Ethernet board to make the connection to the file server when the work station is turned on and to identify that particular workstation. This configuration allows all processing to be done at the Jacobs 110 ETEC workstation. Using the Novell feature of distributed processing, the burden of most of the input/output requests is handled by the memory of an individual workstation within the network. This feature prevents the typical slow down problem many networks experience when the server must use its own memory to manage input and output requests from all the other workstations on the LAN. Approximately 40K of the memory in the Jacobs 110 workstation is used for the network shell. The shell interprets each request made by the user and directs the request to either the file server or DOS, depending on the type of request

At the conclusion of the 1991 Fall Semester a questionnaire was sent to all faculty teaching in this first ETEC classroom. Out of the fifteen questionnaires sent out, fourteen faculty responded. In general, everyone who responded was quite pleased with the technology made available. Yet, there were criticisms. Some were dissatisfied with the quality of the image of the Wolf Visualizer. Most felt that the current placement of the visualizer made it awkward to use. Many asked for more surface space on the teaching station to layout their lecture notes and presentation materials. At the completion of the 1992 Spring Semester the same questionnaire was sent out to the faculty teaching in this ETEC classroom and the same conclusions were replicated. Selective follow-up interviews were also conducted to assist in arriving at some possible solutions to these criticisms.

Many of the School of Management faculty indicated that they could not take full advantage of the technology unless they redesigned their courses and it would be difficult to justify the time or effort it would take unless they were assured of being assigned to an ETEC classroom in the future. Unfortunately, the majority of the faculty assigned to teach in this ETEC classroom in the 1991 Fall Semester were not assigned to this classroom for the 1992 Spring Semester. A fair amount of disappointment was expressed by the School of Management faculty. A positive outcome of this disappointment was that endowment funding was identified by the School of Management to develop a second ETEC classroom.

The planning of this second ETEC classroom for the School of Management provided an opportunity to alter the design of the teaching station and to make appropriate improvements where feasible. The remainder of this paper will discuss this new ETEC classroom and the improvements made, based on faculty feedback.

Educational Technology Equipped Classroom -- Re-Design

This second Educational Technology Equipped Classroom (ETEC) is located in 112 Jacobs Hall and replicates the same presentation technology as the first ETEC classroom located in 110 Jacobs Hall. This new classroom is slightly smaller in seating capacity (55 students) and has some subtle, yet significant improvements in the design of the teaching station as well as some improvements in the processing of video signals and image quality. It should also be noted that the changes incorporated into the teaching station of this second ETEC classroom were also retrofitted into the earlier teaching station in 110 Jacobs Hall. This retrofit could be accomplished at minimal expense due its modular construction. Also, it was felt that both of these ETEC classrooms should be replicated as closely as possible because School of Management faculty could be assigned to teach in either classroom depending on course scheduling and class size.

Planning and Implementation:

Like the earlier Jacobs 110 ETEC classroom, faculty input was sought through questionnaires and meetings. After their initial input, several informal review sessions were held with the faculty to keep them appraised of developments and to gather appropriate feedback. Faculty input is see as absolutely essential if these ETEC classrooms are to be accepted and fully utilized.

A classroom assessment was carried out by the project engineer (Operational Support Services unit) utilizing criteria developed for the earlier MEC and ETEC classrooms. The assessment would determine what problems, if any, existed that would prevent or hinder the proper utilization of media equipment and other kinds of classroom support technology. Issues such as viewing distance, site lines, window blocking, zoned lighting, acoustics, ambient noise, electrical outlets, etc., all affect proper utilization.

The classroom selected (Jacob 112) has a student seating capacity of 55 and met all of the basic criteria. An added feature was that this was a tiered classroom with no windows. Zoned incandescent lighting was already in place as well as an electric wall screen. CAD drawings depicting room layout and site lines are in the Appendix.

The rehab of the classroom took place over the 1992 Summer recess and was carried out by both the trades staff of the Physical Plant and the Operational Support Services staff. The teaching station (podium and side modular cabinet) was permanently fixed in place and conduit run for electrical service and control circuits. All conduit was either trenched in the floor or run in the ceiling. A distributed speaker system was installed in the ceiling as well. All component installation, control circuits and wiring was handled by the Operational Support Services staff.

The overall project took less than six months from start to finish. Approximately three months was spent in planning, design and procurement of equipment. Classroom rehab and installation of the equipment took less than three months. Everything was completed in time for the start of the 1992 Fall semester.

The Teaching Station:

The teaching station consists of a custom-built podium and an attached modular cabinet. Like the earlier Jacobs 110 ETEC classroom, CAD drawings and specifications were developed by the Operational Support Services staff and the unit was custom built by Rabco Design, Inc. of Buffalo, New York.

The significant changes between the earlier teaching station and the current teaching station are in the placement of the Wolf Visualizer and its controls, and the placement of the podium surface lighting. The earlier design placed the Wolf Visualizer on a pull-out shelf and it was accessed from behind the modular cabinet. When the visualizer was in use, the instructor had to stand away from the visualizer and behind the podium which made it awkward to use. The instructor found it difficult to use the surface of the modular cabinet for presentation materials and lecture notes and the visualizer controls were difficult to use because of placement and design.

The Wolf Visualizer is now located on a drawer unit which pulls out to the side of the modular cabinet. A more simplified control pad was custom designed and placed on the top surface of the modular cabinet. The podium lighting was changed from florescent to incandescent and raised a few inches to better illuminate the podium work surface and reduce glare on the instructor's monitor screen. The height of the modular cabinet was also raised a few inches to make the platform of the visualizer more comfortable to use.

Other advancements were made in the electronic circuitry and signal processing. In the earlier ETEC design, only data could be displayed on the podium monitor. Through a scan doubler, both data and video are now displayed on the podium monitor. This allows the instructor to view the same image on the teaching station monitor that is displayed in the classroom through the video/data projector. Alternative approaches were considered to accomplish this design objective (a multi-scan monitor, IBM UltiMedia M-Motion Video, IBM PS/2 TV). Each of these were rejected for a variety of reasons which are too involved to discuss in this paper. The use of a scan doubler for all video signals also brought improved image quality to the front classroom seats by eliminating visible scan lines in the projected image.

An ongoing ETEC design objective is to continue to incorporate improvements which will result in making the computing system(s) more responsive to instructor commands (i.e., faster access to applications, increased speed in interactive sessions, etc.). The PS/2 computer was upgraded from 30 to 80 MB hard drive and the RAM was increased from 2 to 4 MB in order to accommodate new software and allow the system to be more responsive. By also going from a DCA to an Ethernet data network connection, the data throughput rate was significantly expanded (9.6 Kbps to 2-3 Mbps).

The podium and side cabinet are constructed and finished as separate, stand-alone items with 3/4" particle board construction. The interior and exterior are finished with Formica brand laminate. The podium keyboard shelf and the pull-out drawer and one shelf in the side cabinet are on slide-out rails. All other shelving is adjustable. The three doors (one cabinet door and two podium doors) are fitted with hinges allowing doors to be opened a full 270 degrees. The doors are opened with matching combination locks.

The top surface of the podium contains a flush mounted monitor and the system's control panel. When the top door of the podium is opened the keyboard shelf can be pulled out. The auto dial telephone, VHS videotape player and computer (CPU) are also accessible in this compartment. The lower door is not accessible by the instructor. This compartment contains control and security systems.

The top surface of the redesigned side cabinet now serves as a table top for instructor notes and presentation materials. When the door of the side cabinet is opened, the drawer unit for the Wolf Visualizer can be unlatched and pulled out. The arm of the visualizer is then extended and the unit is ready for use. Below the visualizer unit is a Navitar slide to video projector that is on a pull out shelf for ease of loading the carousel tray and turning the projector on. Sufficient storage space exits below the slide projector for the microphone, tape recorder and laser pointer.

The flush mounted panel on the top surface of the podium controls two podium lights, brightness and contrast for the computer monitor, audio level for the VHS player and for an auxiliary input, power and mute switch for the ceiling mounted CRT projector, forward/ reverse switch for the slide to video projector and six switches to control the input to the CRT projector -- Visualizer/VHS player/Slides/PS-2 Computer/RGB1/RGB2. Auxiliary input jacks are located on the top of the side cabinet: two RGB inputs, two 1/4" phone jacks for audio taping and/or playback, and two microphone inputs. An AC duplex plug is located at the base of the side cabinet.

An added feature for ease of instructor utilization is that all components, with the exception of the Navitar slide projector, are automatically turned on when the upper podium door or the side cabinet door are opened. Both doors are wired to electrical interlock switches. There is no need to turn on individual equipment off/on switches. Due to the noise of the cooling fan on the Navitar slide projector, it was felt that this piece of equipment could be turned on only when used for slide presentations.

The audio amplifier for this ETEC classroom is not installed in the teaching station. It is recessed in a classroom wall and not accessible to the instructor. Audio levels are pre-set and the system is equalized for the classroom environment. The controls for the zoned incandescent lighting are on rheostats (each bank of lights are on its separate rheostat). Both the lighting controls and the switch for the projection screen are located on the wall directly behind the teaching station and within easy reach of the instructor.

The Appendix contains CAD drawings of the teaching station, a bid specification sent to vendors for the construction of the teaching station, and a list of equipment and components and their cost. Expenditures for equipment and components came to $38,795.00 for the Jacobs 112 ETEC classroom. The classroom rehab costs from the Physical Plant (materials and labor) came to $4,964.00.

Access and Security:

The proper security of the equipment is an integral part of these Educational Technology Equipped Classrooms. A system was devised that would help protect the equipment from vandalism, theft and unauthorized removal; yet, allow faculty designated to teach in these

classrooms ease of access. Instructors have access to the equipment and systems by opening the upper door on the podium and the door on the side cabinet. Each door has a programmable combination lock set up with the same combination. The combinations are changed once a year. Electronic sensor devices are fastened on to the various components (CRT projector, computer, visualizer, etc.) and if someone attempted to remove the equipment without proper authorization an alarm would go off. Public Safety would automatically be alerted through a telephone line. As an added security precaution, these classrooms are locked after the last scheduled class of the day (around 10:00 pm) and are opened just prior to the start of the first class session (8:00 am). These classrooms are kept locked on weekends (after scheduled Saturday morning classes), holidays and during semester breaks.

Faculty Orientation:

Faculty orientation is carried out by the Associate Director - Media Resources and his staff prior to the start of classes and during the first week. A list of faculty assigned to teach in these ETEC classrooms is obtained through the School of Management. A letter and handout is sent to each faculty member explaining the ETEC program and asking them to attend one of several scheduled orientation sessions or to call and make an individual appointment.

The on-site orientation takes about one hour. The different types of media and classroom support technology are demonstrated. Access to the teaching station, calling for staff assistance and security procedures are covered as well. Discussion is encouraged and then the remainder of the orientation session is spent with hands-on. Each participant has an opportunity to open the doors (combination lock) to the podium and attached cabinet, set-up the equipment, practice using the equipment and then properly secure the equipment. Upon conclusion of the orientation session faculty are given a laminated, wallet size card with the combination to the locks. Each ETEC classroom is set-up with a different set of combinations. A Media Equipment Services staff member is also available at the beginning of the semester in the event that an instructor needs some assistance.

Concluding Remarks

The new Jacobs 112 ETEC classroom has been in use for one full semester. Although there has been no formal assessment of this new facility through a survey instrument, informal feedback points out that this classroom has been well received. Faculty are quite pleased with the placement of the Wolf Visualizer and the location of the custom control pad. The ability to display both data and video on the podium monitor has also proved to be an asset. Faculty have also remarked that the quality of the projected image (through the use of the scan doubler) appears to be better as well.

During the Winter break, an older Media Equipped Classroom will be upgraded into a Educational Technology Equipped Classroom with the redesigned teaching station. This third ETEC classroom will be used primarily by the Department of Computer Science. In addition to the teaching station, an older Macintosh IIsi will be upgraded to a Macintosh IIvx with an internal CD ROM and the GE 310 Imager projector will be upgraded to a GE 414 Imager projector. A Wolf Visualizer will be added as well. This ETEC classroom will be completed in time for the start of the 1993 Spring Semester.

New Directions:

A "Technology in the Classroom" working group has been recently formed within Academic Services, Computing and Information Technology to further explore how technology can best be developed and utilized in the classroom environment. This group will make recommendations for further development of Educational Technology Equipped Classrooms; and, look at ways in which some of the emerging technologies such as CD ROM and Digital Video Interactive (DVI) affect the classroom environment. This group, working closely with faculty, will also determine directions for development of additional ETEC software options; either to be made available locally at the teaching station, or remotely, through the campus data network.

Another challenge of this working group will be to explore ways in which the ETEC concept can be effectively incorporated in large lecture halls. A Natural Sciences and Mathematics lecture hall complex is currently under construction (five tiered lecture halls ranging from 100 seats to 385 seats and five 90 seat classrooms) and funding has been allocated for classroom technology. Plans are also underway to convert existing lecture halls to the ETEC service model as well.

The Appendix:

A variety of information is contained in the Appendix. A number of CAD drawings are offered showing the teaching station, room layout, and systems interconnection. The Appendix also contains information regarding the cost of the equipment and components, a copy of the purchase requisition and bid specifications for the custom-built teaching station, a list of the software currently used by the School of Management, and computer menu screens.

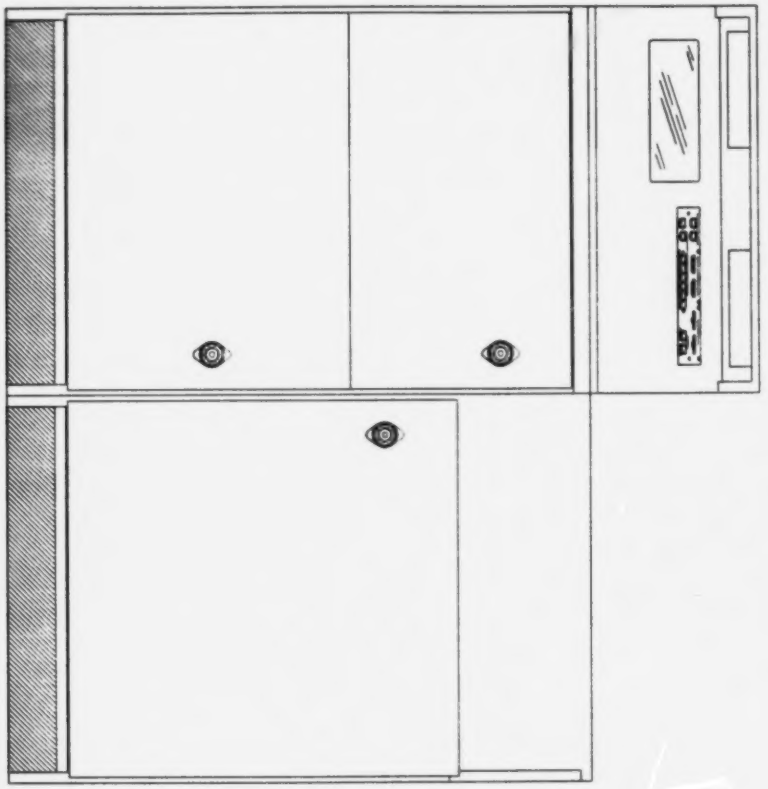
Conclusion:

In conclusion, the purpose of this presentation was to give an overview of the latest Educational Technology Equipped Classroom (ETEC) at the State University of New York at Buffalo with specific reference to the re-design of the teaching station based on faculty feedback. Although this latest ETEC classroom has only been in service for one semester, all indications are that it is been well received by the faculty assigned to teach in this facility.

Appendix

1. CAD Drawing of Teaching Station: Front View (doors closed)
2. CAD Drawing of Teaching Station: Front View (visualizer extended)
3. CAD Drawing of Teaching Station: Side View (original design vs. new design)
4. CAD Drawing of Teaching Station: Side View (dimensions)
5. CAD Drawing of Teaching Station Podium: Front View (dimensions)
6. CAD Drawing of Teaching Station Cabinet: Side View (dimensions)
7. CAD Drawing of Jacobs 112 Room Layout
8. CAD Drawing of Teaching Station Control Panel
9. CAD Drawing of Teaching Station Remote Control for Wolf Visualizer
10. CAD Drawing of Teaching Station Podium and Cabinet Work Surfaces: Top View
11. CAD Drawing of System Interconnection Diagram
12. CAD Drawing of ETEC Network Connections
13. ETEC Computer Menu Screens (main menu, software applications, Telnet and School of Management software)
14. Jacobs 112 Equipment/Cost Data
15. Jacobs 112 Teaching Station Purchase Requisition and Bid Specification

INSTRUCTORS'S VIEW 13 DOORS CLOSED (JACOBS 112)



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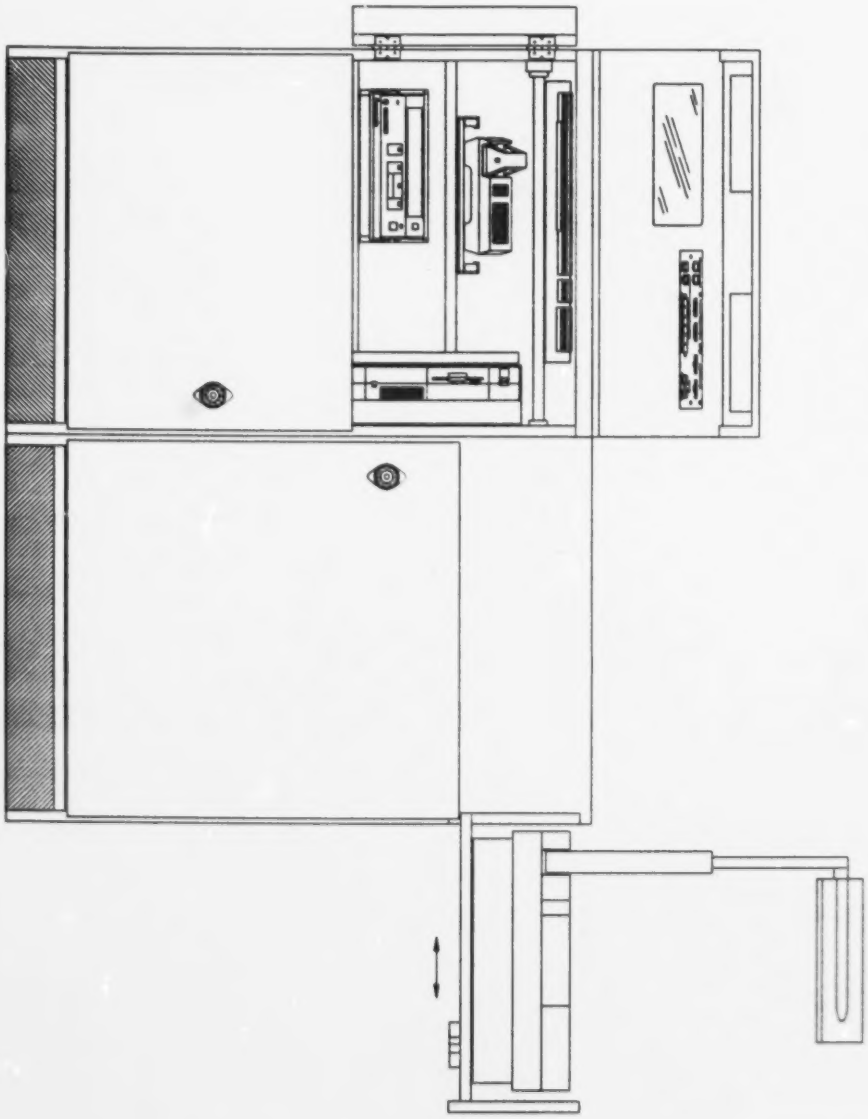
INSTRUCTOR'S VIEW (JACOBS 112)



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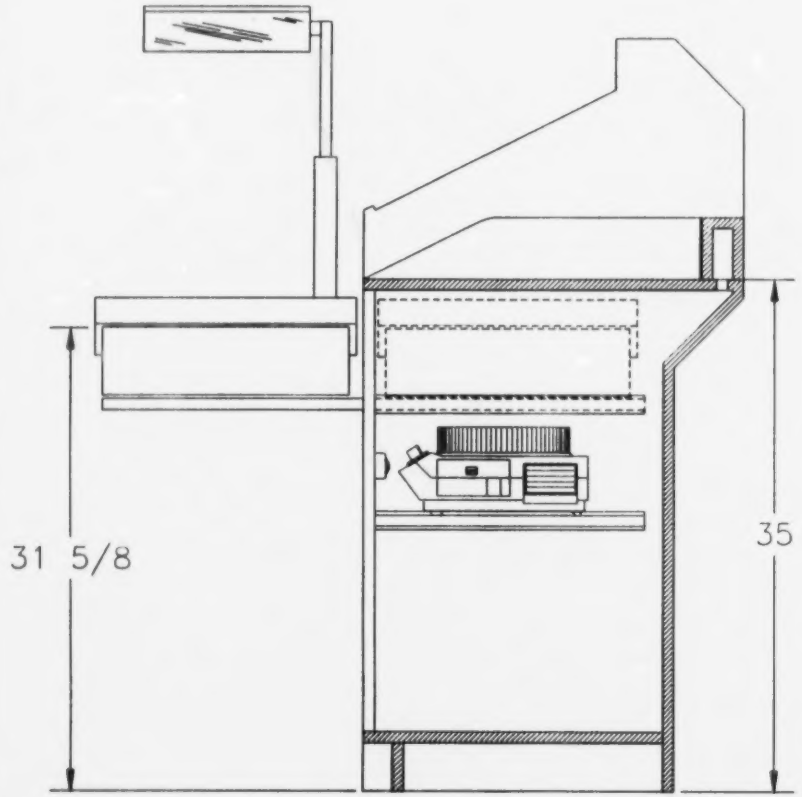
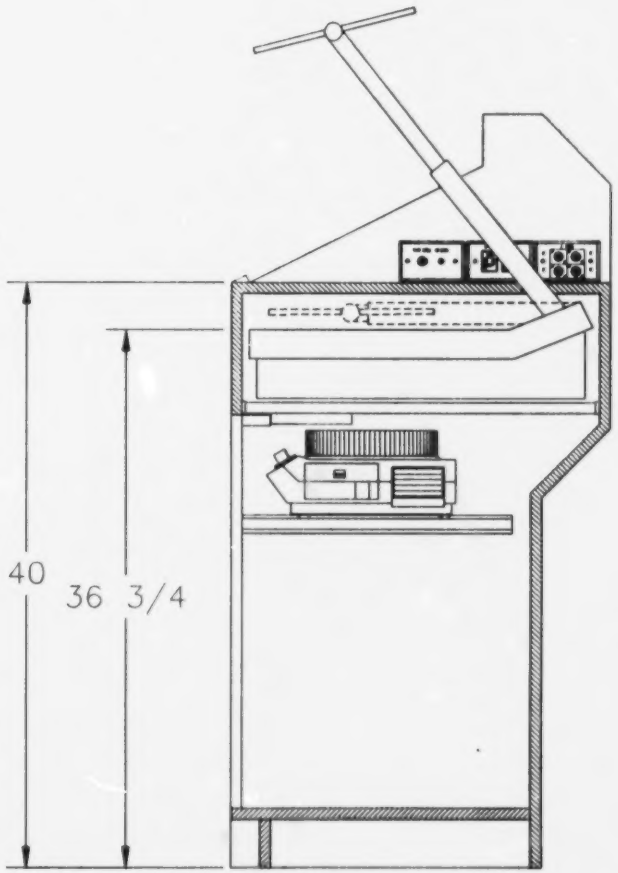
ORIGINAL DESIGN



NEW VERSION



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FILE NAME: JACV01	DISK:		
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BUILDING/CLIENT: JACOBS	DESCRIPTION: INSTRUCTOR STATION		

19

RIGHT SIDE VIEW

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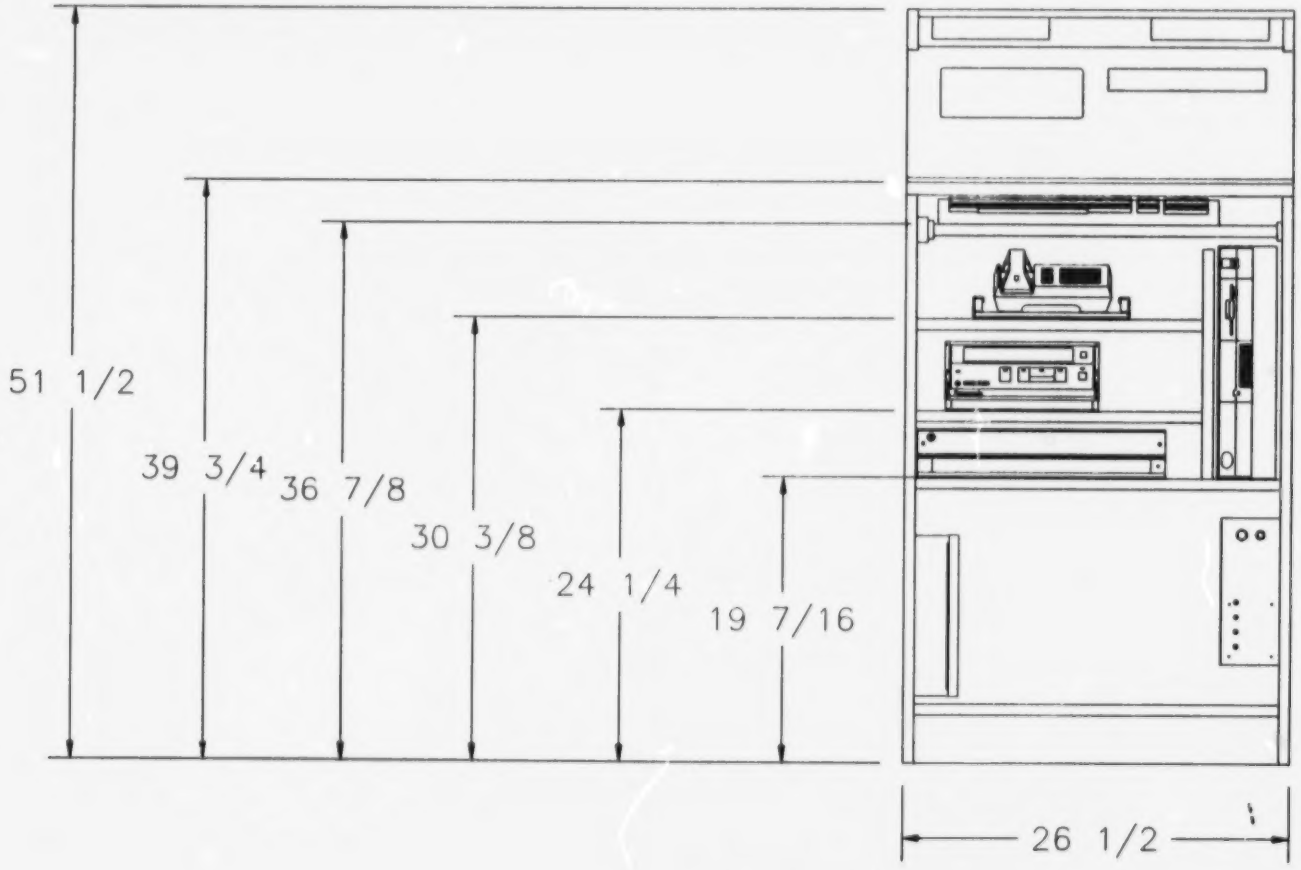

21

PODIUM (DOORS REMOVED)

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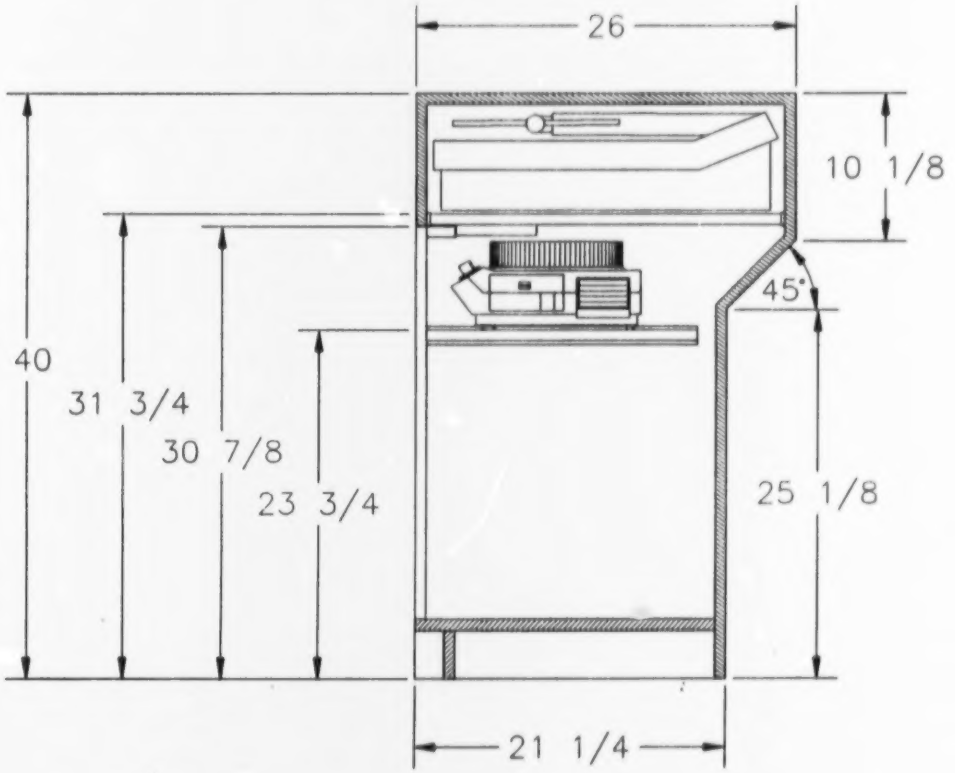

23

CABINET

24

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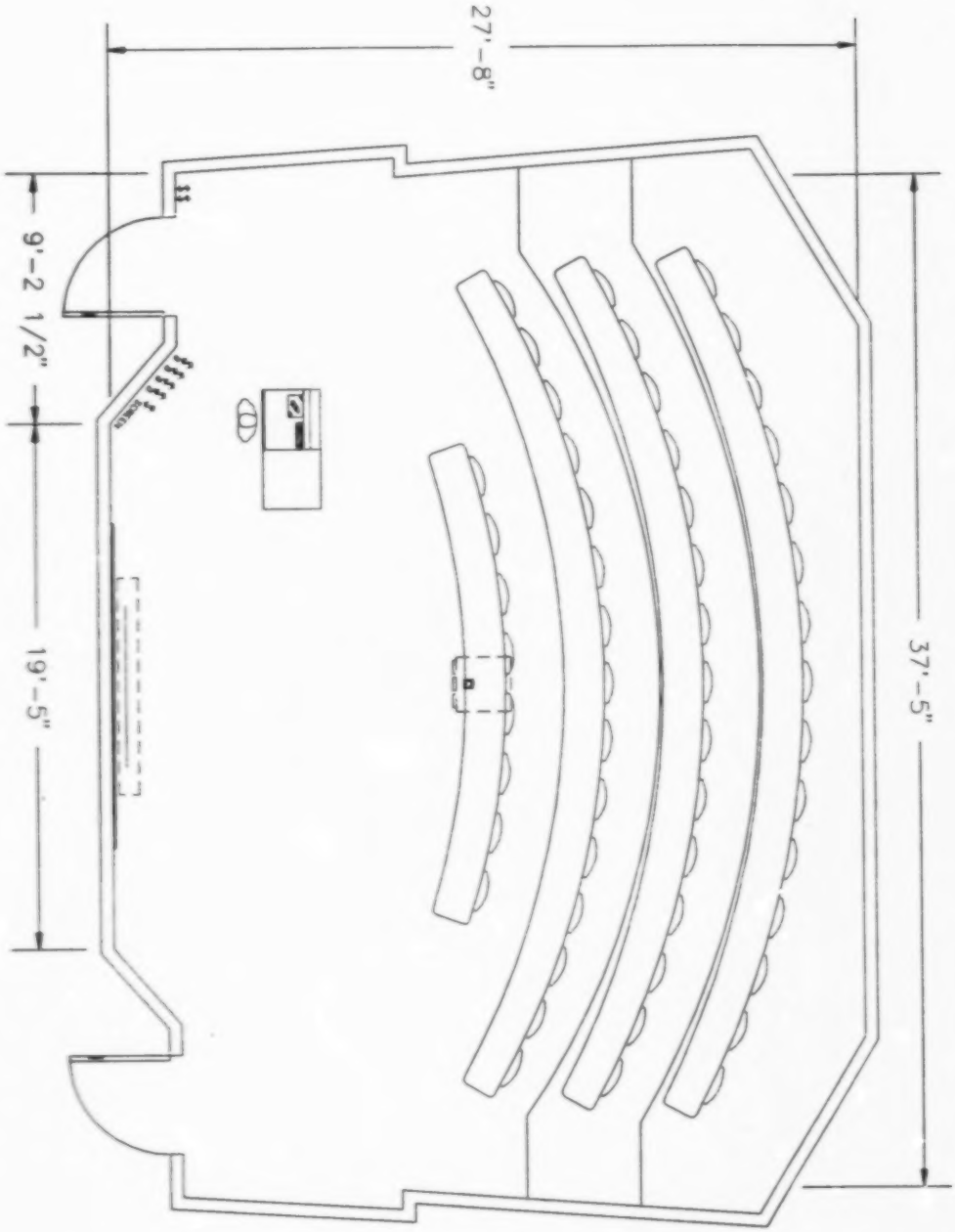
FILE NAME: JACV18	DESK:
SYSTEM: ETEC-2	#
DESCRIPTION: INSTRUCTOR STATION	
BUILDING/CLIENT: JACOBS	



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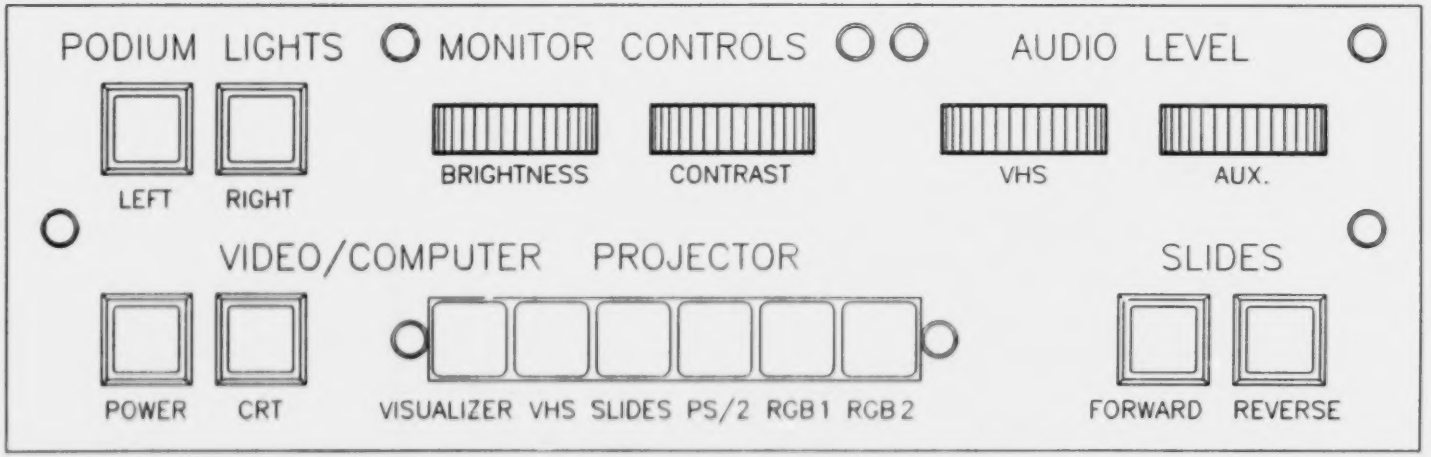
DWN. BY: JSG	APP. BY:
DATE STARTED: 01/27/91	
LAST REVISION: 01/04/93	
SCALE: NO SCALE	
FILE NAME: JAC112A2	DISK:
SYSTEM: ETEC-2	#

BUILDING/CLIENT: JACOBS

DESCRIPTION: ROOM LAYOUT



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DWN. BY: J.S.G	APP. BY:
DATE STARTED: 07/22/91	
LAST REVISION: 12/20/91	
SCALE: NO SCALE	
FILE NAME: JACP15	DISK:
SYSTEM: ETEC-1	#
BUILDING/CLIENT: JACOBS	DESCRIPTION: MAIN CONTROL PANEL

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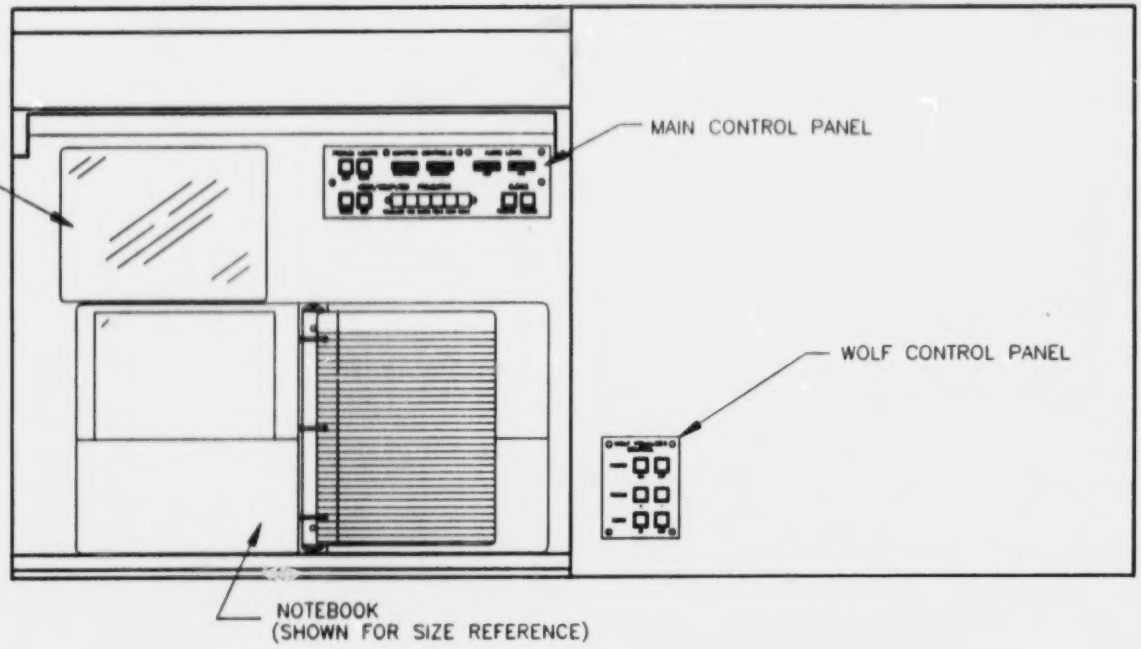
DWN. BY: J.S.G.	APP. BY:
DATE STARTED: 07/22/91	
LAST REVISION: 05/26/92	
SCALE: NO SCALE	
FILE NAME: JACU20A	DISK:
SYSTEM: JACOBS	#

BUILDING/CLIENT: MEC

DESCRIPTION: WOLF CONTROL PANEL



TOP VIEW OF PODIUM AND CABINET WORK SURFACES

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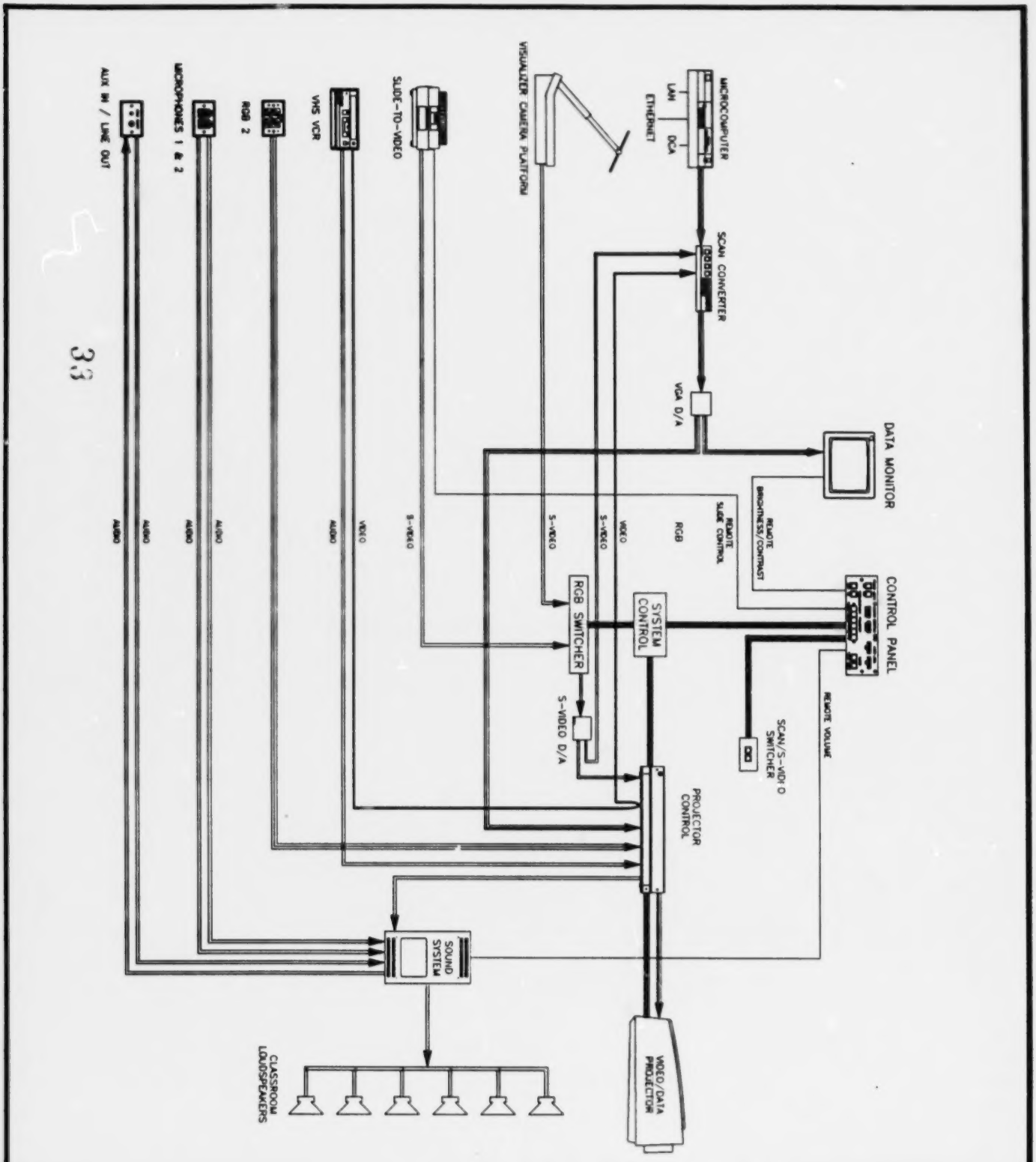
DWN. BY: J.S.G.	APP. BY:
DATE STARTED: 01/28/91	
LAST REVISION: 11/21/91	
SCALE: NO SCALE	
FILE NAME: JACP12	DISK:
SYSTEM: ETEC-1	#
DESCRIPTION: INSTRUCTOR STATION	
BUILDING/CLIENT: JACOBS	



33

3

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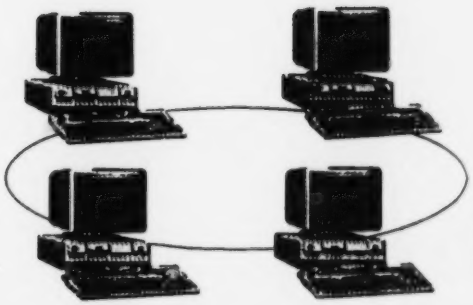
DWN. BY: TJC	APP. BY:
DATE STARTED: 01/08/92	
LAST REVISION: 09/16/92	
SCALE: NO SCALE	
FILE NAME: JACP13	DISK:
SYSTEM: ETEC-1	#

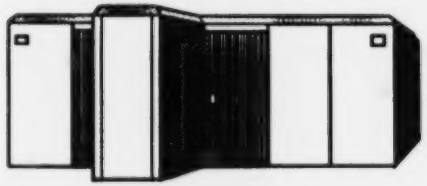
BUILDING/CLIENT: JACOBS

DESCRIPTION: EQUIPMENT SCHEMATIC

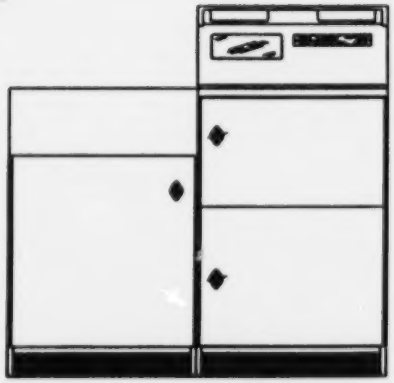
ETEC Network Connections



Building LAN



IBM 3090



ETEC Instructor Station

VAX Cluster

UNIX

Internet

ETEC Computer Menu Screens

Main Menu

A) Software Applications
B) DOS Utilities
C) Learning about your IBM System
D) Print Queue Information

Telnet

A) Telnet to a Remote Host
B) Telnet to the IBM 3090
C) Telnet to the SUN
D) Telnet to the VAX/VMS

Software Applications

A) As Easy As 4.0
B) dBase IV, v1.5
C) Telenet
D) DrawPerfect, v1.1
E) FTP to mainframe
F) LOTUS 1-2-3, v2.2
G) SPSS\PC+, v4.0
H) WordPerfect
I) Management Departmental Software

School of Managment Software

A) Mayers Tap for MGA 609
B) Schroder Bellows Harvard Business School Case
C) The Innovative Investor
D) Markstat - Statistical Analysis
E) Results - Market Response Program
F) Copy Management Course Files
G) Decision Support System
H) Excelerator/IS
I) SSAP 4.0
J) UBIS - UB Information
K) Database of Finance Research

Jacobs 112 Equipment/Cost Data

	Equipment and Components	Amount
1.	Teaching Station	$ 3,800.00
2.	G.E. #414 Video/Data Projector	8,790.00
3.	Video/Data Projector Ceiling Bracket	537.17
4.	Switcher, Distribution Amp, Cables	1,476.50
5.	S-Video Components	819.62
6.	InLine IN1222 Scan Doubler	2,436.00
7.	PS/2-55SX Computer, 8513 Monitor	2,337.00
8.	G.E. Wolfe Visualizer	6,870.00
9.	Panasonic AG-1000B Video Cassette Player	506.78
10.	Navitar Videomate 2000	3,604.00
11.	Sound System Items	4,397.60
12.	Laser-X LDP-5AV Pointer	410.00
13.	Auto Dial Telephone	170.03
14.	Electronic Alarm System and Accessories	192.17
15.	Projection Screen Fabric and Tension Bar	178.76
16.	Cable and Custom Built Items	1,798.00
17.	Electrical and Miscellaneous Supplies	471.20
	Total	$ 38,794.83

PURCHASE REQUISITION

STATE UNIVERSITY OF NEW YORK AT BUFFALO

REQUISITION
№ 949488 S

PURCHASE ORDER NUMBER

VENDOR RABCO DESIGN, INC.

STREET 8925 SHERIDAN DRIVE

CITY & STATE CLARENCE, N.Y. 14031, 631-3010

FEDERAL I.D. #

REQUISITION DATE

STATE CONTRACT # GROUP #

ACCOUNT NUMBER

FACILITY SCH. OF MANAGEMENT, JACOBS 112 PROJ.

DEPARTMENT EDUCATIONAL TECHNOLOGY SERVICES
ATTN: WM. MAIMAN

SHIP TO BUILDING WENDE ROOM NO 318

REQUESTED DELIVERY 6/17/92

THIS IS NOT A VENDOR'S ORDER

INSTRUCTIONS:
1. MAKE SEPARATE REQUISITION FOR EACH VENDOR AND COMMODITY GROUP
2. ATTACH ALL LETTERS, QUOTATIONS, AND OTHER APPLICABLE PAPERS TO THIS REQUISITION.
3. FORWARD THIS REQUISITION TO THE PURCHASING AGENT
4. USE DOUBLE SPACE ON ITEM ENTRIES

F.O.B. ☐ DESTINATION ☐ SHIPPING POINT _____ CITY | SHIP VIA | TERMS | BUYER

Item No.	Description of Material/Service	Quantity	Unit	Price	Amount
	AUDIO VISUAL INSTRUCTOR STATION				
1	CONSTRUCTION OF CUSTOM INSTRUCTOR STATION CONSISTING OF SEPARATE PODIUM AND CABINET SECTIONS FOR JACOBS 112 BASED ON DESIGN OF JACOBS 110 AND FEATURING VARIOUS CHANGES. ALL CABINETRY HARDWARE TO BE PROVIDED UNDER THIS ORDER MUST BE REVIEWED AND APPROVED BY UNIVERSITY PROJECT COORDINATOR. EQUIPMENT ITEMS AND CONTROL PANELS REFERENCED IN THE ENCLOSED ATTACHMENTS ARE NOT TO BE CONSIDERED PART OF THIS ORDER. ALSO TO BE PROVIDED UNDER THIS ORDER ARE FOUR (4) FULL WIDTH ADJUSTABLE SHELVES AS ACCESSORY ITEMS. ALL DRAWINGS AND CONSTRUCTION NOTES ENCLOSED AS ATTACHMENTS TO THIS ORDER ARE FOR REFERENCE PURPOSES ONLY. CONTRACTOR IS REQUIRED TO COMPLETELY REVIEW AND ASCERTAIN ALL CONSTRUCTION REQUIREMENTS AND DIMENSIONS WITH UNIVERSITY PROJECT COORDINATOR PRIOR TO BEGINNING CONSTRUCTION. **PAYMENT PLAN**: A PARTIAL PAYMENT PLAN CONSISTING OF 60% PAYMENT AFTER COMPLETION OF CABINET (WITH LAMINATE) AND REMAINDER PAYABLE AFTER COMPLETE INSTALLATION IN JACOBS 112 CLASSROOM. PLEASE NOTIFY WM. MAIMAN AT 831-3761 IF THERE WILL BE A DELAY IN SHIPMENT OF THIS ITEM(S).	1	EA		3,800 00

PLEASE CHECK APPROPRIATE BOX/BOXES
☐ MINORITY-OWNED BUSINESS ☐ SMALL BUSINESS (UNDER 100 EMPLOYEES) ☐ HANDICAPPED ☐ WOMEN-OWNED BUSINESS

SOLICITED MBE _____ WBE _____

IN ACCORDANCE WITH ☒ TELEPHONE FAX ☐ WRITTEN QUOTATION BY BOB BARONE DATED 4/16/92 OUR REF NO

PO/Contract	Line	Act	Amount	Dept	Cost Center	Var	Yr	Object

FUNDS AVAILABLE BY

DATE

SUNY ACCOUNT	SUB	OBJECT

40

White: Purchasing Copy
Pink: Requisitioner - Detach and keep

REQUESTED BY TELEPHONE NO

AUTHORIZED SIGNATURE

Custom Instructor Station Construction Notes

1. Podium and Cabinet to be constructed and finished as separate, standalone items.

2. Podium and Cabinet to be 3/4" heavy-duty industrial grade-dense particle board construction; finished all exterior and inside sides with Formica brand #118 Finnish Oak (or equal) laminate.

3. Podium keyboard shelf, and top two Cabinet shelves, to be on slide-out rails capable of supporting 150 lbs. All other shelving to be adjustable (32mm system), and perforated to facilitate airflow. Shelf cutouts required for wiring access.

4. All doors fitted with 3 hinges allowing doors to be opened a full 270 degrees. All doors to also include matching combination locks. Locks to match type installed in Jacobs 110.

5. Podium monitor compartment to be constructed to accommodate either an IBM 8513 or IBM 8515 monitor. A monitor mounting configuration is required which will accommodate either monitor model, and allow monitor positioning adjustment. Monitor mounting configuration to match existing Jacobs 110 configuration.

6. Podium work surface to be constructed with flush-mounted safety glass panel over the monitor areas; and, a surface cutout for a flush-mounted system(s) control panel. Cabinet work surface to be constructed with a surface cutout for a flush-mounted system(s) control panel.

7. Provisions must be made in the construction of both the Podium and Cabinet sections to permit vertical airflow and equipment ventilation. Provisions also must be made to allow for the mounting of recessed Wiremold type electrical boxes.

8. Bottom panels in both the Podium and Cabinet constructed so as to be removable, or to provide access to the base area for ease in connection of system(s) wiring.

9. Slide-out platform to be provided for Campus Telephone.

10. Cabinet connector panel constructed so as to be removable.

11. Separate 2" x 4" (nominal) floor mounting frame, to be provided for both the Podium and Cabinet to facilitate installation and reinforcement for anchoring hardware.

12. Progress Meetings shall be scheduled with the Project Coordinator, Wm. Maiman, 831-3761, to review progress and allow for custom fitting of equipment.